WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Wednesday, November 08, 2006

Hide?	Set Name	Query	Hit Count
		DB=PGPB,USPT; PLUR=YES; OP=ADJ	
☐	L8	L1 and surfactant	7
☐	L7	l1 and 134/$.ccls.	1
☐	L6	l4	7
☐	L5	L4 and surfactant	1
☐	L4	L1 and cleaning	7
☐	L3	L1 with cleaning	1
☐	L2	L1 with surfactant	1
☐	L1	lens with (immersion lithography systems)	30

END OF SEARCH HISTORY

Hit List

First Hit | Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 21 through 30 of 30 returned.

☐ 21. Document ID: US 20050231695 A1

L1: Entry 21 of 30 File: PGPB Oct 20, 2005

PGPUB-DOCUMENT-NUMBER: 20050231695
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050231695 A1

TITLE: Method and system for immersion lithography using high PH immersion fluid

PUBLICATION-DATE: October 20, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Wang, Chao -Hsiung	Hsinchu		TW
Tseng, Horng-Huei	Hsin-chu		TW

US-CL-CURRENT: 355/53

ABSTRACT:

A method and system is disclosed for conducting immersion photolithography. The system includes at least one lens for transmitting a predetermined radiation on a predetermined product substrate, and a fluid volume in contact with the lens on its first end and with the product substrate on its second end, wherein the fluid volume has a molar concentration of hydroxyl ions more than 10.sup.-7 mole per liter.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 22. Document ID: US 20050205108 A1

L1: Entry 22 of 30 File: PGPB Sep 22, 2005

PGPUB-DOCUMENT-NUMBER: 20050205108
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050205108 A1

TITLE: Method and system for immersion lithography lens cleaning

PUBLICATION-DATE: September 22, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chang, Ching-Yu	Yen-Sun		TW
Lin, Chin-Hsiang	Hsin-Chu		TW

US-CL-CURRENT: 134/1; 355/53

ABSTRACT:

A method and system for cleaning lens used in an immersion lithography system is disclosed. After positioning a wafer in the immersion lithography system, a light exposing operation is performed on the wafer using an objective lens immersed in a first fluid containing surfactant, wherein the surfactant reduces a likelihood for having floating defects adhere to the wafer and the objective lens.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 23. Document ID: US 20050122497 A1

L1: Entry 23 of 30 File: PGPB Jun 9, 2005

PGPUB-DOCUMENT-NUMBER: 20050122497
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050122497 A1

TITLE: Immersion lithographic process using a conforming immersion medium

PUBLICATION-DATE: June 9, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Lyons, Christopher F.	Fremont	CA	US
Babcock, Carl P.	Campbell	CA	US
Kye, Jongwook	Pleasanton	CA	US

US-CL-CURRENT: 355/53

ABSTRACT:

A method of making a device using a lithographic system having a lens from which an exposure pattern is emitted. A conforming immersion medium can be positioned between a photo resist layer and the lens. The photo resist layer, which can be disposed over a wafer, and the lens can be brought into intimate contact with the conforming immersion medium. The photo resist can then be exposed with the exposure pattern so that the exposure pattern traverses the conforming immersion medium.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 24. Document ID: US 20050100745 A1

L1: Entry 24 of 30 File: PGPB May 12, 2005

PGPUB-DOCUMENT-NUMBER: 20050100745
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050100745 A1

TITLE: Anti-corrosion layer on objective lens for liquid immersion lithography applications

PUBLICATION-DATE: May 12, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Lin, Burn Jeng	Hsinchu		TW
Lu, David	Taipei		TW

US-CL-CURRENT: 428/446; 204/192.1, 428/696, 428/697, 428/698, 428/702

ABSTRACT:

Disclosed is an objective lens adapted for use in liquid immersion photolithography and a method for making such a lens. In one example, the objective lens has multiple lens elements, one of which includes a transparent substrate and a layer of anti-corrosion coating (ACC). The ACC is formed proximate to the transparent substrate and is positioned between a liquid used during the liquid immersion photolithography and the transparent substrate to protect the transparent substrate from the liquid.

☐ 25. Document ID: US 20050073670 A1

L1: Entry 25 of 30 File: PGPB Apr 7, 2005

PGPUB-DOCUMENT-NUMBER: 20050073670
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050073670 A1

TITLE: Method and device for immersion lithography

PUBLICATION-DATE: April 7, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Carroll, Allen	Stockholm		SE

US-CL-CURRENT: 355/77; 355/18, 430/322

ABSTRACT:

The present invention relates to an immersion lithographic system for patterning a

work piece arranged at an image plane and covered at least partly with a layer sensitive to electromagnetic radiation. Said system comprising a source emitting electromagnetic radiation onto an object plane, a mask, adapted to receive and modulate said electromagnetic radiation at said object plane and to relay said electromagnetic radiation toward said work piece, and an immersion medium contacting at least a portion of a final lens of said lithographic system and a portion of said work piece, wherein an area of said contacting is restricted by capillary forces. The invention further relates to a method for patterning a workpiece.

☐ 26. Document ID: US 20050046934 A1

L1: Entry 26 of 30 File: PGPB Mar 3, 2005

PGPUB-DOCUMENT-NUMBER: 20050046934
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050046934 A1

TITLE: Method and system for drying a substrate

PUBLICATION-DATE: March 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Ho, Chung-Peng	Austin	TX	US
Nafus, Kathleen	Austin	TX	US
Yoshioka, Kaz	Austin	TX	US
Yamaguchi, Richard	Gilbert	AZ	US

US-CL-CURRENT: 359/380

ABSTRACT:

A method and system is described for drying a thin film on a substrate following liquid immersion lithography. Drying the thin film to remove immersion fluid from the thin film is performed prior to baking the thin film, thereby reducing the likely hood for interaction of immersion fluid with the baking process. This interaction has been shown to cause non-uniformity in critical dimension for the pattern formed in the thin film following the developing process.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 27. Document ID: US 7125652 B2

L1: Entry 27 of 30 File: USPT Oct 24, 2006

US-PAT-NO: 7125652
DOCUMENT-IDENTIFIER: US 7125652 B2

TITLE: Immersion lithographic process using a conforming immersion medium

DATE-ISSUED: October 24, 2006

PRIOR-PUBLICATION:

DOC-ID	DATE
US 20050122497 A1	June 9, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lyons; Christopher F.	Fremont	CA		US
Babcock; Carl P.	Campbell	CA		US
Kye; Jongwook	Pleasanton	CA		US

US-CL-CURRENT: 430/311; 430/322

ABSTRACT:

A method of making a device using a lithographic system having a lens from which an exposure pattern is emitted. A conforming immersion medium can be positioned between a photo resist layer and the lens. The photo resist layer, which can be disposed over a wafer, and the lens can be brought into intimate contact with the conforming immersion medium. The photo resist can then be exposed with the exposure pattern so that the exposure pattern traverses the conforming immersion medium.

21 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 1

☐ 28. Document ID: US 7119035 B2

L1: Entry 28 of 30 File: USPT Oct 10, 2006

US-PAT-NO: 7119035
DOCUMENT-IDENTIFIER: US 7119035 B2

TITLE: Method using specific contact angle for immersion lithography

DATE-ISSUED: October 10, 2006

PRIOR-PUBLICATION:

DOC-ID	DATE
US 20060110945 A1	May 25, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ho; Bang-Ching	Hsin-Chu			TW
Shih; Jen-Chieh	Yongkang			TW

US-CL-CURRENT: 438/800; 359/245

ABSTRACT:

A method for performing immersion lithography on a semiconductor wafer is disclosed. The method includes positioning the semiconductor wafer beneath a lens and applying a fluid between a top surface of the semiconductor wafer and the lens. An additive can be provided to the top surface so that any droplet of the fluid that forms on the top surface of the semiconductor wafer will have a contact angle between about 40.degree. and about 80.degree..

11 Claims, 4 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

☐ 29. Document ID: US 7091502 B2

L1: Entry 29 of 30 File: USPT Aug 15, 2006

US-PAT-NO: 7091502
DOCUMENT-IDENTIFIER: US 7091502 B2

TITLE: Apparatus and method for immersion lithography

DATE-ISSUED: August 15, 2006

PRIOR-PUBLICATION:

DOC-ID	DATE
US 20050253090 A1	November 17, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gau; Tsai Sheng	Hsinchu			TW
Chen; Chun-Kuang	Chung-li			TW
Liu; Ru-Gun	Yongkang			TW
Lin; Burn Jeng	Hsinchu			TW

US-CL-CURRENT: 250/492.2

ABSTRACT:

An immersion lithography system for semiconductor manufacturing provides a lens assembly that moves relative to a wafer surface and includes a nozzle and drain assembly that is coupled to, and moves along, the lens assembly. The nozzle and drain assemblies may be disposed circumferentially opposite each other about the lens or an annular ring may be provided that surrounds the lens and includes a plurality of selectable alternating nozzles and drains. The nozzle and drain assemblies may rotatably surround the lens. At least a portion of the wafer being patterned is immersed in a liquid provided by the nozzle assembly and a flow direction is controlled by manipulating the nozzle and drain assemblies. Flow

direction may be advantageously directed outwardly to reduce particulate contamination.

23 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 4

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

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☐ 30. Document ID: US 7070915 B2

L1: Entry 30 of 30 File: USPT Jul 4, 2006

US-PAT-NO: 7070915
DOCUMENT-IDENTIFIER: US 7070915 B2

TITLE: Method and system for drying a substrate

DATE-ISSUED: July 4, 2006

PRIOR-PUBLICATION:

DOC-ID	DATE
US 20050046934 A1	March 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ho; Chung-Peng	Austin	TX		US
Nafus; Kathleen	Austin	TX		US
Yoshioka; Kaz	Austin	TX		US
Yamaguchi; Richard	Gilbert	AZ		US

US-CL-CURRENT: 430/322; 355/67, 355/72, 430/329, 430/330

ABSTRACT:

A method and system is described for drying a thin film on a substrate following liquid immersion lithography. Drying the thin film to remove immersion fluid from the thin film is performed prior to baking the thin film, thereby reducing the likely hood for interaction of immersion fluid with the baking process. This interaction has been shown to cause non-uniformity in critical dimension for the pattern formed in the thin film following the developing process.

34 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 6

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw De

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Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Term	Documents
LENS	314954
LENSES	141453
IMMERSION	87531
IMMERSIONS	1230
LITHOGRAPHY	63328
LITHOGRAPHIES	333
LITHOGRAPHYS	1
SYSTEMS	1790963
SYSTEM	2924937
(((IMMERSION ADJ LITHOGRAPHY) ADJ SYSTEMS) WITH LENS).PGPB,USPT.	30
(LENS WITH (IMMERSION LITHOGRAPHY SYSTEMS)).PGPB,USPT.	30

Display Format: - Change Format

Previous Page Next Page Go to Doc#

Hit List

First Hit | Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 1 through 7 of 7 returned.

☐ 1. Document ID: US 20060216651 A1

L6: Entry 1 of 7 File: PGPB Sep 28, 2006

PGPUB-DOCUMENT-NUMBER: 20060216651
PGPUB-FILING-TYPE:
DOCUMENT-IDENTIFIER: US 20060216651 A1

TITLE: Method and system for drying a substrate

PUBLICATION-DATE: September 28, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Ho; Chung-Peng	Austin	TX	US
Nafus; Kathleen	Austin	TX	US
Yoshioka; Kaz	Austin	TX	US
Yamaguchi; Richard	Chandler	AZ	US

US-CL-CURRENT: 430/311; 430/322

ABSTRACT:

A method and system is described for drying a thin film on a substrate following liquid immersion lithography. Drying the thin film to remove immersion fluid from the thin film is performed prior to baking the thin film, thereby reducing the likely hood for interaction of immersion fluid with the baking process. This interaction has been shown to cause non-uniformity in critical dimension for the pattern formed in the thin film following the developing process.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 2. Document ID: US 20060103818 A1

L6: Entry 2 of 7 File: PGPB May 18, 2006

PGPUB-DOCUMENT-NUMBER: 20060103818
PGPUB-FILING-TYPE:
DOCUMENT-IDENTIFIER: US 20060103818 A1

TITLE: METHOD AND APPARATUS FOR CLEANING A SEMICONDUCTOR SUBSTRATE IN AN IMMERSION LITHOGRAPHY SYSTEM

PUBLICATION-DATE: May 18, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Holmes; Steven J.	Guilderland	NY	US
Hakey; Mark C.	Fairfax	VT	US
Furukawa; Toshiharu	Essex Junction	VT	US
Horak; David V.	Essex Junction	VT	US

US-CL-CURRENT: 355/53; 430/395

ABSTRACT:

A method and apparatus for reduction and prevention of residue formation and removal of residues formed in an immersion lithography tool. The apparatus including incorporation of a cleaning mechanism within the immersion head of an immersion lithographic system or including a cleaning mechanism in a cleaning station of an immersion lithographic system.

☐ 3. Document ID: US 20050270505 A1

L6: Entry 3 of 7 File: PGPB Dec 8, 2005

PGPUB-DOCUMENT-NUMBER: 20050270505
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050270505 A1

TITLE: Method of photolithography using a fluid and a system thereof

PUBLICATION-DATE: December 8, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Smith, Bruce W.	Webster	NY	US

US-CL-CURRENT: 355/53; 355/30

ABSTRACT:

A photolithographic exposure system for use on a photoresist on a substrate includes an illumination system, a photomask with one or more object patterns, a projection optical exposure system, and a fluid dispensing system. The projection optical exposure system is positioned to project an image of the one or more object patterns toward an image plane. The fluid dispensing system positions a fluid between the projection optical exposure system and the photoresist on the substrate. The fluid has a refractive index value above a refractive index value of water and an absorbance below 0.8 per millimeter at wavelengths between about 180 nm and about 300 nm.

☐ 4. Document ID: US 20050205108 A1

L6: Entry 4 of 7 File: PGPB Sep 22, 2005

PGPUB-DOCUMENT-NUMBER: 20050205108
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050205108 A1

TITLE: Method and system for immersion lithography lens cleaning

PUBLICATION-DATE: September 22, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chang, Ching-Yu	Yen-Sun		TW
Lin, Chin-Hsiang	Hsin-Chu		TW

US-CL-CURRENT: 134/1; 355/53

ABSTRACT:

A method and system for cleaning lens used in an immersion lithography system is disclosed. After positioning a wafer in the immersion lithography system, a light exposing operation is performed on the wafer using an objective lens immersed in a first fluid containing surfactant, wherein the surfactant reduces a likelihood for having floating defects adhere to the wafer and the objective lens.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

☐ 5. Document ID: US 20050100745 A1

L6: Entry 5 of 7 File: PGPB May 12, 2005

PGPUB-DOCUMENT-NUMBER: 20050100745
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050100745 A1

TITLE: Anti-corrosion layer on objective lens for liquid immersion lithography applications

PUBLICATION-DATE: May 12, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Lin, Burn Jeng	Hsinchu		TW
Lu, David	Taipei		TW

US-CL-CURRENT: 428/446; 204/192.1, 428/696, 428/697, 428/698, 428/702

ABSTRACT:

Disclosed is an objective lens adapted for use in liquid immersion photolithography and a method for making such a lens. In one example, the objective lens has multiple lens elements, one of which includes a transparent substrate and a layer of anti-corrosion coating (ACC). The ACC is formed proximate to the transparent substrate and is positioned between a liquid used during the liquid immersion photolithography and the transparent substrate to protect the transparent substrate from the liquid.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 6. Document ID: US 20050046934 A1

L6: Entry 6 of 7 File: PGPB Mar 3, 2005

PGPUB-DOCUMENT-NUMBER: 20050046934
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050046934 A1

TITLE: Method and system for drying a substrate

PUBLICATION-DATE: March 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Ho, Chung-Peng	Austin	TX	US
Nafus, Kathleen	Austin	TX	US
Yoshioka, Kaz	Austin	TX	US
Yamaguchi, Richard	Gilbert	AZ	US

US-CL-CURRENT: 359/380

ABSTRACT:

A method and system is described for drying a thin film on a substrate following liquid immersion lithography. Drying the thin film to remove immersion fluid from the thin film is performed prior to baking the thin film, thereby reducing the likely hood for interaction of immersion fluid with the baking process. This interaction has been shown to cause non-uniformity in critical dimension for the pattern formed in the thin film following the developing process.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw De

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☐ 7. Document ID: US 7070915 B2

L6: Entry 7 of 7 File: USPT Jul 4, 2006

US-PAT-NO: 7070915
DOCUMENT-IDENTIFIER: US 7070915 B2

TITLE: Method and system for drying a substrate

DATE-ISSUED: July 4, 2006

PRIOR-PUBLICATION:

DOC-ID	DATE
US 20050046934 A1	March 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ho; Chung-Peng	Austin	TX		US
Nafus; Kathleen	Austin	TX		US
Yoshioka; Kaz	Austin	TX		US
Yamaguchi; Richard	Gilbert	AZ		US

US-CL-CURRENT: 430/322; 355/67, 355/72, 430/329, 430/330

ABSTRACT:

A method and system is described for drying a thin film on a substrate following liquid immersion lithography. Drying the thin film to remove immersion fluid from the thin film is performed prior to baking the thin film, thereby reducing the likely hood for interaction of immersion fluid with the baking process. This interaction has been shown to cause non-uniformity in critical dimension for the pattern formed in the thin film following the developing process.

34 Claims, 6 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 6

Term	Documents
4.PGPB,USPT.	7
(L4).PGPB,USPT.	7